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ABSTRACT

Few studies have compared the educational experiences and outcomes of students attending historically black colleges and universities (HBCU) to those of students attending traditionally white institutions. This study consists of three analyses that contain some justification for the continued existence of HBCUs, threatened by court decisions that question their role in equal educational systems. The study first reviews findings from a previously published study of undergraduates (H. Wenglinsky, 1996) that used a nationally representative database (the National Postsecondary Student Aid Study) to conclude that black students often choose HBCUs because costs are perceived to be, and are indeed, lower. This study also found that students at HBCUs were more likely to aspire to postbaccalaureate degrees. The second analysis used data from the American Association of Universities/Association of Graduate Schools to compare retention rates of black graduate students who had attended HBCUs or traditionally white schools. Students from HBCUs were more likely to persist in graduate studies. The final analysis compared graduate fields of study for students from the two types of schools using the 1993 database of the Graduate Record Examinations. Graduates of HBCUs were more likely to plan on entering a program in the sciences, engineering, or business than were black students from traditionally white schools. These findings suggest that HBCUs prepare black students for the sciences and engineering, professions in which they are traditionally underrepresented. Their low cost encourages many students to attend college who may not have attended any college otherwise. Both of these benefits support the continuation of HBCUs. An appendix discusses study methodology. (Contains 1 table, 7 figures, and 27 references.) (SLD)

ED 415 239

Policy Information Report

# Students at Historically Black Colleges and Universities: Their Aspirations & Accomplishments

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**August 1997**

## PREFACE

The survival of Historically Black Colleges and Universities depends increasingly on showing that they provide education benefits not otherwise available. In this report, Harold Wenglinsky puts the claims made for the educational value of these colleges to the test. To what types of careers do their students aspire, compared to those who attend other colleges? What happens to these students when they reach graduate school? Without these schools, would some Black students choose not to go to college at all?

Policy Information Reports are intended to inform important educational debates, not enter them. We hope this report contributes to the important discussion and debate now taking place regarding the continued existence of these colleges that have long played such an important role in higher education.

*Paul E. Barton*
*ETS Policy Information Center*

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Various findings from this research have been presented at the Annual Meeting of the Sociology of Education Association, the Eighth Annual College Board Historically Black Colleges and Universities Conference, and the Mid-Atlantic Region Historically Black Colleges and Universities Faculty Showcase.

## EXECUTIVE SUMMARY

Changes in the structure of postsecondary education now jeopardize the continued existence of Historically Black Colleges and Universities. Most were created at a time when Black students could not attend White institutions. In the wake of *Brown v. Board of Education of Topeka* (1954) and the Higher Education Act of 1965, however, Black students have had unprecedented access to Traditionally White Institutions. The courts, concerned that Historically Black Colleges and Universities encourage separate and unequal systems of higher education, have begun to question the continued existence of these institutions. In *U.S. v. Fordice* (1992), the Supreme Court held that Historically Black Colleges and Universities are indeed a vestige of segregation, and that state legislatures must either eliminate them or find a compelling educational justification for their continued existence. State legislatures have begun to act to meet this requirement through changes in admissions policies and proposals for mergers and closures.

Advocates of Historically Black Colleges and Universities have suggested various potential justifications for these schools. One tradition, going back to W.E.B. Du Bois, emphasizes their ability to prepare Black students to become community leaders. Indeed, Historically Black Colleges and Universities have historically been responsible for training teachers and social workers, and their graduates are some of the most well known public figures. Martin Luther King Jr., Thurgood Marshall, and Andrew Young, Jr., all graduated from Historically Black Colleges and Universities. Another tradition, going back to Booker T. Washington, emphasizes the vocational benefits of Historically Black Colleges and Universities. Many of these schools emphasize the sciences and engineering, encouraging Black students to start careers in those professions.

Prior research, however, provides little support for either of these possible justifications. Few studies have compared the educational experiences and outcomes of students attending Historically Black Colleges and Universities to those attending Traditionally White Institutions, and those that have find few differences between the two types of institution. These studies are, however, subject to significant methodological caveats. In particular, none of these studies is national in scope. Also, no large-scale research has been conducted, to date, on the aspirations and experiences of doctoral students who had graduated from Historically Black Colleges and Universities.

This study consists of three analyses that test some possible educational justifications of Historically Black Colleges and Universities. First, it reviews findings from a previously published study comparing undergraduates who were attending Historically Black Colleges and Universities to undergraduates who were attending Traditionally White Institutions. Both Black and White students were sampled. The study applied multivariate statistical techniques to a nationally representative database of undergraduates. One finding from the study was that students choose Historically Black Colleges and Universities over Traditionally White Institutions primarily for reasons of cost; they perceive tuitions to be lower, the cost of living to be lower, and financial aid to be more generous. This perception is accurate. Students attending Historically Black Colleges and Universities paid, on average, $1,946 in tuition as opposed to $3,310 for students attending Traditionally White Institutions. A second finding from the study was that while students attending Historically Black Colleges and Universities were no more likely than students attending Traditionally White Institutions to aspire to be community leaders, they were more likely to aspire to a post-baccalaureate degree.

The second analysis compared the retention rates of Black graduate students who had attended Historically Black Colleges and Universities to those who had attended Traditionally White Institutions. The data were drawn from the Database of the American Association of Universities/Association of Graduate Schools Project for Research on Doctoral Education, which tracks doctoral candidates at approximately 40 institutions in ten programs. The data could not be used to

conduct multivariate analyses, but it was possible to produce descriptive information on graduate student retention. The analysis found that Black students who had attended Historically Black Colleges and Universities were more likely to persist than Black students attending Traditionally White Institutions.

The final analysis compared graduate fields of study between students who had attended Historically Black Colleges and Universities and students who had attended Traditionally White Institutions. Both Black and White students were sampled. The study applied multivariate statistical techniques to the 1993 database of test registrants for the Graduate Record Examination, the test required by many graduate programs conferring Ph.Ds. It found that graduates of Historically Black Colleges and Universities, when applying to take the Graduate Record Examination, were more likely to plan on entering a program in the sciences, engineering, or business than were students who had graduated from Traditionally White Institutions.

This research suggests a benefit provided by Historically Black Colleges and Universities not provided by Traditionally White Institutions — they prepare Black students for careers in the sciences and engineering, professions in which they are most underrepresented, and that are conducive to positive labor market outcomes. Because students often cite cost as a reason for choosing Historically Black Colleges and Universities, and because so many come from families of low socioeconomic status, it is probable that many students would not have attended any college at all had there not been a Historically Black College to attend. The benefits of Historically Black Colleges and Universities, then, accrue not only to students who choose them over Traditionally White Institutions, but also to students who choose them over moving directly into the job market.

## INTRODUCTION

Historically Black Colleges and Universities (HBCUs) are at a crossroad. All came into existence before 1965, during a period when Black students were largely excluded from other institutions of higher education, and their mission was to provide these students with opportunities for scholarship and professional training. While efforts to desegregate higher education, advocated by many graduates of HBCUs, have opened up Traditionally White Institutions (TWIs) to far greater numbers of Blacks than ever before, these efforts ironically have jeopardized the existence of the HBCUs themselves. A 1992 U.S. Supreme Court decision requiring states to "educationally justify or eliminate" all vestiges of segregation in higher education categorized the HBCUs as one of these vestiges. State legislatures have responded with proposals to close, merge, or radically reconstitute various HBCUs. The continued existence of HBCUs, then, is in some doubt.

The survival of HBCUs will depend primarily on whether or not they bestow an educational benefit that TWIs do not. If such a benefit exists, then there may be constitutional grounds for the schools' continued existence despite the fact that they are seen as a vestige of segregated higher education. Defenders of the schools have suggested numerous possible justifications: the schools provide a more socially cohesive environment for minority students; they provide an education that is more culturally sensitive to the needs of minority students; they are particularly successful at preparing students for leadership roles in their communities; and they successfully prepare students for the job market, particularly in the sciences and engineering. The empirical basis for these assertions is weak, however. Most studies comparing students who attend HBCUs to those attending TWIs find little difference in their experiences and outcomes (e.g., Allen, 1992; Davis, 1991). These studies therefore do not provide much guidance regarding what benefits HBCUs confer on their students that TWIs do not.

This report tests the claims of HBCU advocates in light of various data sources that contain information on students attending HBCUs and comparable students attending TWIs.[1] The findings from the National Postsecondary Student Aid Study (NPSAS), previously published, suggest that the key justification for HBCUs is that they prepare students successfully for graduate school and various professions. These findings, however, leave unanswered a question hotly debated among advocates of HBCUs — which professions? Since Booker T. Washington and W.E.B. Du Bois debated the role of the HBCUs nearly a century ago, some educators have emphasized the role of the schools in preparing students for community leadership, seeing the HBCUs' mission and strength as preparing students for careers in teaching, social work, or the social sciences, by providing a rigorous and comprehensive liberal arts education. Other educators have contended that the schools are best at preparing students for careers in engineering, the sciences, business, and the industrial arts, through a primarily vocational education. This report presents information obtained from the 1993 database of Graduate Record Examinations® (GRE) test registrants and a developing longitudinal database of the American Association of Universities/Association of Graduate Schools (AAU/AGS) Project for Research on Doctoral Education. Based on an analysis of these data, this report finds that the primary educational justification of the HBCUs lies in the latter category: They are more successful than TWIs in preparing students for careers in engineering, science, or business.

1 For this study, HBCUs are compared to all other colleges and universities, lumped together as TWIs. This comparison overlooks many interesting potential comparisons. For instance, it would also be interesting to know about differences between public HBCUs and public four-year colleges with large Black populations. It would also be interesting to know about differences between public HBCUs and the public colleges and universities with which states are proposing to merge them. Given the large number of possible comparisons that could be made, it was decided to begin by using all colleges other than HBCUs as the comparison group. Since this is only a first step, it is hoped that further research will be conducted on differences between HBCUs and specific types of TWIs.

## History of the HBCUs

Behind many of today's prominent Black leaders lies a college education at an HBCU. Famous graduates of HBCUs include political figures Douglas Wilder, Louis Sullivan, and Andrew Young, Jr.; writers Toni Morrison and Alice Walker; opera singer Jessye Norman; and television personalities Oprah Winfrey and Phylicia Rashad. These HBCU graduates are only the most recent generation to achieve prominence. Earlier graduating HBCU classes have included Martin Luther King Jr., Medgar Evers, Rosa Parks, Thurgood Marshall, Ralph Ellison, W.E.B. Du Bois, and Booker T. Washington (American Association of University Professors, 1995).

Yet the role of the HBCUs over time has changed. In the past, when most of these famous graduates attended the schools, HBCUs offered almost the only opportunity for Blacks to receive a post-secondary education, while today they are one alternative among many. Despite this difference, the character of the HBCUs today has been formed through their history and traditions; that history therefore bears repeating.[2]

The first HBCUs were created in the North prior to the Civil War. Between the American Revolution and the Civil War, there were significant restrictions on the education of Blacks, free and slave, in the South. Many Southern states had statutes forbidding slaves to learn to read or write. While such restrictions limited the education of Blacks, they did not prevent it entirely; various schools provided Blacks the equivalent of an elementary and secondary education. But the prospects for Blacks obtaining postsecondary education were limited primarily to the North. There, some institutions, such as Oberlin College in Ohio, admitted Blacks. Recognizing the limited educational opportunities for Blacks, churches founded colleges exclusively for their education — Lincoln University was founded in Pennsylvania by the Presbyterian Church in 1854, and Wilberforce University in Ohio was founded by the Methodist Episcopal Church in 1856.

Following the Civil War, many of the churches that had advocated abolition and had founded schools in the North established private colleges for Blacks in the South. Before 1870, the American Missionary Association, a Congregationalist group, had founded seven colleges and 12 normal schools (schools that prepared teachers), the American Baptist Home Mission Society had founded three colleges, and the Methodist Episcopal Church had founded two. By 1890, more than 200 colleges dedicated to serving Black students had been founded. The schools were financed by a combination of funds from missionary groups, Black church groups, and the Freedman's Bureau, a federal agency created after the Civil War to provide financial assistance to Blacks and poor Whites.

Most Black colleges founded before 1890

[2] This history is synthesized from: Jencks & Riesman, 1968; Jones, 1995; Hoffman, Snyder & Sonnenberg, 1992; Roebuck & Murty, 1993.

were private. Many public colleges for Blacks, however, were founded in response to the Second Morrill Act of 1890. This act provided federal financial support to states to found land-grant colleges. It stipulated, however, that states would either have to provide Blacks with equal access to the land-grant colleges, or establish separate institutions for Black students. Most Southern states chose the latter course, and, between 1890 and 1899, 17 all-Black public colleges were founded. These institutions, in combination with the surviving private ones, became the backbone of Black postsecondary education for the next 60 years; by 1895 they produced 1,100 college graduates yearly.

Public and private institutions differed significantly, however, in their nature and function. Private institutions tended to provide a comprehensive liberal arts education. Most of their graduates were prepared to be teachers and preachers. Public institutions, on the other hand, were more vocationally oriented. While some were normal schools that prepared teachers, most prepared skilled industrial and agricultural workers. This split in the type of institution was reflected in a pedagogical split among educators. Some, like Booker T. Washington, viewed vocationally oriented education as better suited to the economic progress of Blacks. He argued that such education would provide them with the skills requisite to enter the upper levels of the labor force and be competitive with Whites. Others, like W.E.B. Du Bois, viewed a liberal arts education as preferable. He argued that such an education would prepare students to become leaders of their communities, helping less educated Blacks become more successful.

The relationship between the majority regime of the South and the Black colleges tended to be one of benign neglect. Whereas in the antebellum period any education of Blacks was strongly opposed, in the postbellum period there were significant reasons for permitting the development of Black colleges. The private colleges produced teachers and preachers, to whom the majority regime was more than willing to delegate responsibility for serving the Black community. In addition, the maintenance of public Black colleges was necessary for obtaining federal funds for public White colleges. Nevertheless, the states allocated only a bare minimum of funds to the public Black colleges, resulting in significant inequalities in resources between these and White colleges. The decision of the Supreme Court in *Plessy v. Ferguson* (1896), that state educational facilities could be segregated so long as there was a degree of fiscal equity, did not dramatically change this situation. Vast funding inequities between Black and White colleges remained.

A series of Supreme Court cases from 1935 through 1954 gradually changed the system. These cases involved the issue of out-of-state tuition grants. In some states, no separate professional school for Blacks existed. Further, when Blacks applied to a state's White school and were considered qualified for admission, they were generally offered tuition grants providing financial support to attend a professional school in another state. The Supreme Court held that this arrangement was unconstitutional, creating an unnecessary hardship for Black applicants. It was not until *Brown v. Board of Education of Topeka* (1954), however, that desegregation began in earnest.

*Brown v. Board of Education of Topeka*, focusing on elementary and secondary education, held that segregation by its nature caused fiscal inequities between Black and White schools, and ordered states to desegregate them. The case was followed by additional decisions applying specifically to higher education. Later, the Civil Rights Act of 1964 prohibited the spending of federal funds on segregated schools and colleges. The Higher Education Act of 1965 provided financial aid to individual students who otherwise could not afford post-secondary education (disproportionately Black) as well as direct grants to HBCUs to reduce resource inequities with TWIs. *Adams v. Richardson* (1973) held that 10 states were still maintaining segregated systems of higher education and required the further integration of both TWIs and HBCUs. The Supreme Court decided that desegregation should be a reciprocal responsibility between TWIs and

HBCUs, with each trying to make their student bodies and faculties more diverse.

The changes in the legislative and judicial requirements for state public higher education systems between 1954 and 1973 resulted in a significant alteration of the demographics of HBCUs. The opening of TWIs to Black applicants led Blacks to enroll in them, in turn leading to a decline in enrollments in HBCUs. There now remain 103 HBCUs, located in 19 states and the District of Columbia. Of these, 53 are under private control 50 are public institutions, 89 are four-year institutions, and the rest are two-year institutions. Enrollments range from less than 1,000 to about 8,000 students. In total, nearly 300,000 students attend HBCUs (Snyder & Hoffman, 1995).

In response to the desegregation cases, HBCUs began to recruit White faculty and students, although with less success than the TWIs had in recruiting Blacks. By 1992, three HBCUs were predominantly White, and 10 were more than 20 percent White. On average, 13.1 percent of HBCU students were White, a 3.6 percent increase since 1976.

Interestingly, HBCUs have also become increasingly feminized, with the percentage of male students decreasing consistently from 47 percent in 1976 to 40.9 percent in 1990.

Yet, despite the increasing ethnic and gender diversity of these schools and the draining of Blacks to TWIs, HBCUs continue to educate large numbers of Blacks. In fact, enrollments at HBCUs have recently begun to increase. Currently, 21 percent of all Black postsecondary students attend HBCUs, and 28 percent of all degrees awarded to Blacks are from HBCUs. And while enrollments remained relatively constant from 1976 to 1986, subsequently they began to increase, with a 15 percent increase in enrollments between 1986 and 1990. This increase has been distributed evenly across public and private institutions and across two-year and four-year institutions (Hoffman et al., 1992; Snyder & Hoffman, 1995).

Yet, just as the demand for HBCUs has again begun to increase, government efforts to support the schools have declined. One indication of this is the reduction in financial support for HBCUs. While total spending increased at HBCUs, it did so at a markedly slower rate than at TWIs. In 1988-89 dollars, expenditures at HBCUs increased by 21.4 percent from 1976 to 1988, whereas the average increase for all universities was 26.6 percent. This failure to keep pace with other educational institutions created significant financial pressures on HBCUs. From 1986 to 1989, enrollments increased twice as quickly as revenues. Thus, resource problems have begun to re-emerge at HBCUs, only 30 years after the federal government had singled them out for financial support in 1965 (Hoffman et al., 1992).

More significant than the depletion of resources is a change in the Supreme Court's attitude toward the schools, as manifested in *U.S. v. Fordice* (1992). In that case, the Supreme Court held that the mere lack of formal racial barriers between TWIs and HBCUs in a state was not sufficient evidence that the state's college system was desegregated. The Supreme Court held that there were three tests to determine if a system was still segregated: Was there duplication of resources and programs between institutions? Were institutions ethnically homogenous? And, was there no specific educational justification for the existence of such institutions? The court held that the defendant, the state of Mississippi, had failed the first two tests, since the TWIs were predominantly White, the HBCUs were predominantly Black, and the HBCUs duplicated the courses offered by the TWIs. Consequently, the court required Mississippi either to justify or to eliminate the HBCUs.

This decision will have significant consequences for the HBCUs. States have begun to act to come into compliance with the decision, through proposals for changes in admissions criteria, mergers, and closures. For example, Mississippi raised entrance requirements at its three public HBCUs, which resulted in enrollment declines ranging from 9.9 percent at Alcorn State University to 20.1 percent at Mississippi Valley State University (Healy, 1996a). In Tennessee, a public HBCU has already been merged with a TWI,

thus dramatically changing the institutional identity and mission of Tennessee State University, the HBCU. The governor of Louisiana has proposed merging all three of his state's public HBCUs with TWIs; if enacted, the proposal would end Black governance of HBCUs in Louisiana (Guernsey, 1996; Healy, 1996b). While these are all public institutions, *U.S. v. Fordice* also poses a threat to private HBCUs. Private HBCUs depend on large amounts of federal funding, without which their enrollments will shrink. In *Bob Jones University v. United States* (1983), the Supreme Court held that such funding can be taken away from institutions deemed to be in violation of various antidiscrimination rules.

The threat of mergers and closures puts pressure on HBCUs to provide educational justifications for their continued existence. Doing so involves returning to the debate between Washington and Du Bois at the turn of the last century: Is the purpose of the schools to prepare students for community leadership or for economic competition? It is to this question, as well as to the larger question of what constitutes the educational justification of the schools, that we now turn.

## The Purpose of HBCUs: The Arguments and the Empirical Evidence

The notion of the "educational justification" of HBCUs involves identifying educational benefits these schools offer that do not exist at TWIs. During an age of segregation, the benefit of the HBCUs was incontrovertible — they provided postsecondary education to students who otherwise could not obtain it. Yet, since the desegregation of the TWIs, that benefit no longer exists in that Blacks can, if they have the money, attend TWIs. Other benefits unique to HBCUs must be identified; otherwise the courts consider it preferable for Black students to attend TWIs.

Educators in contact with HBCUs have identified some ways in which they believe these schools do a better job than TWIs in educating Blacks. Some educators claim that HBCUs are uniquely able to produce leaders (Barthelemy, 1984). They argue that education at HBCUs focuses on teaching students how to fight oppression and to represent the Black community. Others argue that HBCUs are innovative in integrating community service into their curricula, thus preparing students for involvement in their communities (Smith, 1984). Still others argue that HBCUs prepare students for nontraditional careers in the social service occupations, or even in agriculture, and some claim that HBCUs are carving out an occupational niche for Blacks in engineering or the professions (Jackson, 1984). There is broad consensus among advocates and educators that the relative ethnic homogeneity of the schools, their predominantly Black faculties, and their small size (relative to the public institutions these students would most likely attend if there were no HBCUs) should be expected to positively affect student outcomes at HBCUs. Yet there is some difference in emphasis as to whether these outcomes lie primarily in preparing students to be community leaders and to join the helping professions (teaching or social work), or in preparing them for careers in the sciences, business, or engineering (Garibaldi, 1984).

This disagreement reflects differing opinions dating back to the Du Bois-Washington debate. Both Du Bois and Washington regarded the high levels of social cohesion at HBCUs as beneficial, believing that Black students would be better able to learn while in a supportive environment. They differed, however, on some of the other benefits described by advocates. Du Bois emphasized the ability of the schools to produce community leaders, as do the advocates who today argue that HBCUs excel in preparing students for careers in social work and teaching. Washington emphasized the ability of schools to make students more economically competitive in the job market, as do those advocates who emphasize the ability of the HBCUs to produce engineers and scientists.[5]

[5] While an HBCU student who becomes a teacher or social worker is certainly competing in the job market, the primary goal of those careers, in the views of Du Bois and Washington, is to support the community rather than to achieve economic success.

Despite the fact that researchers have been studying HBCUs for more than 25 years, the empirical evidence has not successfully identified an educational justification for HBCUs. In the 1960s, researchers were interested in discovering whether or not the occupational aspirations of Black students were keeping pace with the new opportunities available to them. The largest study done at the time found that HBCU students still tended to aspire to and enter low-status occupations; the study also found that women at HBCUs had lower occupational aspirations than their male counterparts (Gurin & Katz, 1966). The study did not, however, compare students attending HBCUs to students attending TWIs. Without conducting such a comparison, it is impossible to know what benefits HBCUs provide that TWIs do not.

Many of the subsequent studies have sought to compare the benefits of HBCUs and TWIs, and have not found differences. A study of educational attainment was not able to distinguish the impact of institutional characteristics on minority educational attainment from the impact of socioeconomic status (SES) and other social and psychological characteristics of students (Jackson & Epps, 1987). Because educators pointed to the importance of social cohesion at HBCUs, a study of the relationship between social cohesion and educational outcomes at both HBCUs and TWIs was conducted, but found the relationship between the two to be quite weak (Davis, 1991). Using the National Study of Black College Students, a large-scale longitudinal (although not nationally representative) database, Allen (1992) compared the educational experiences of students attending HBCUs and TWIs in the areas of grade point average (GPA), occupational aspirations, social environment, and self-esteem. Although Allen concluded that the comparisons pointed to the benefits of HBCUs in terms of most of these experiences, in fact the differences he found were generally not statistically significant and therefore provide little indication of differences between HBCUs and TWIs.

Some methodological caveats of these studies should be noted. First, none was nationally representative. It is therefore not known how typical the results are of the population of U.S. Black college students. Second, most of the studies analyzed only Black students. Including White students in the sample is important to distinguish between differences due to attending HBCUs and differences associated with being Black (Allen, 1992; Allen & Haniff, 1991; Smith, 1991). Third, many of these studies, in comparing students attending HBCUs and those attending TWIs, did not take into account other characteristics of students that may have affected the outcomes being analyzed. This omission can result in inaccurate estimates of the relationship between attending an HBCU and those outcomes (Davis, 1991; Jackson & Swan, 1991).

There are a few studies, however, that suggest some potential differences between HBCUs and TWIs. Thomas (1987, 1991) found that Black students attending HBCUs were more likely to major in business, engineering, or the sciences. This finding is significant from the perspective of labor market outcomes, as she noted, because the income potential of these fields is higher than that of the liberal arts majors. Trent (1991) found that Black students attending HBCUs were more likely than Black college students in general to select majors in engineering, science, or business, and that this difference was in evidence in both a 1975 cohort and a 1981 cohort.

Another difference between students attending HBCUs and those attending TWIs was uncovered by Nettles (1991). Nettles examined characteristics of post-secondary students and their institutions that were associated with student achievement, as measured by GPA, and student progression, as measured by the number of credits students took each semester. While he found the racial composition of the school to be unrelated to GPA, he did find that Black students attending institutions where they were the minority had lower progression rates than Black students attending institutions where they were the majority.

A final difference was found by Astin, Tsui, and Avalos (1996). Their study suggests that Black students attending HBCUs are more likely

than Black students attending TWIs to complete their degrees. When prior student achievement (as measured by high school grades and SAT® scores), institutional size, and institutional selectivity were taken into account, Black students attending HBCUs were found to be 17 percent more likely than their counterparts at TWIs to complete their degrees.

Yet, while these studies suggest a few possible differences between HBCUs and TWIs, these differences are not sufficiently compelling to amount to an educational justification of HBCUs. Regarding the choice of undergraduate major findings, it is not known what these presage for the graduate education and career plans of HBCU students. It is important to know which fields of study students attending HBCUs actually choose for their postbaccalaureate degree, since the careers for which these fields prepare students often require postbaccalaureate education. It is also important to know the career plans of students attending HBCUs, since in some cases students may not choose their undergraduate major for purely economic reasons. Regarding the progression rate findings, it is not known what courseloads imply for educational or occupational outcomes of students attending HBCUs.

In sum, while advocates of HBCUs have put forward numerous potential justifications of these schools, the bulk of empirical research has found little support for them. If, as these studies suggest, there are no differences in the educational experiences and outcomes of Black students attending TWIs and HBCUs, there is no reason why Black students attending HBCUs cannot accomplish the same goals at TWIs. The studies that found little difference between HBCUs and TWIs, however, also possessed methodological shortcomings that, when addressed, might very well reverse their findings. The remainder of this report discusses the findings from three analyses that attempt to address these problems.

## Analysis of the National Postsecondary Student Aid Study of 1990[4]

One database that provides useful information that is national in scope on students attending HBCUs is the National Postsecondary Student Aid Study of 1989-90 (NPSAS). The study was conducted by Westat under contract from the National Center for Education Statistics of the Department of Education. Information was collected on about 72,000 students attending postsecondary institutions. This sample of students was selected to make it possible to generalize to the nation as a whole. The information collected included financial aid information (grants, loans, and other forms of assistance); educational experiences in school (social life, academic life); and attitudes and aspirations. Since some of these students attended HBCUs, it is possible to compare HBCU students to students attending TWIs by examining the HBCU students and a comparable sample of students attending TWIs.

In total, 1,429 students are analyzed in this study. The two research questions to be addressed are:

- Why do students choose HBCUs over TWIs?
- How do students at HBCUs differ from students at TWIs in their aspirations and experiences?

Answering these questions involves using various statistical techniques that address some of the methodological problems discussed with regard to the prior research. The sample is nationally representative, making it possible to draw conclusions for the U.S. as a whole. The sample includes both Black and White students, making it possible to compare the experiences of each at the two types of institutions. Various other characteristics of students can also be taken into account, such as their SES, gender, age, and marital status, since these too are measured in the database.

It is particularly important to take these student characteristics into account, because there are large differences in these characteristics between students attending HBCUs and those attending TWIs. HBCU students appear to be of a much lower SES; the adjusted gross incomes of their parents are significantly lower than those of TWI parents. These HBCU students also tend to be younger and are less likely to be married. This perhaps reflects the fact that the vast majority of these schools are four-year institutions, and many are private liberal arts colleges. Such institutions tend to recruit students fresh out of high school and emphasize the importance of campus life. Many of the Black TWI students attend commuter schools, which emphasize adult education.

### Choice of an HBCU

The NPSAS study finds that students choose to attend HBCUs for two main reasons: (1) Their parents attended HBCUs; and (2) HBCUs are more affordable than TWIs. Students were asked 15 possible reasons for why they chose to attend the school in which they were enrolled.

The reasons offered were:

[4] For full study, see Wenglinsky, 1996.

- The school has a good reputation.
- The school offers a generous financial aid package.
- The school has an interesting set of course offerings.
- Parents like the school.
- Parents had attended the school.
- Students think they will obtain a better job by graduating from the school.
- The tuition is lower.
- The cost of living in the area is lower.
- Students have friends attending the school.
- The school is close to home.
- Students can work while in school.
- Students can live at home.
- Students can live far away from home.
- The school is good at placing students in jobs.
- Students can finish the program quickly.

For each reason, students were asked to choose from "very important," "somewhat important," and "not important." The current study compares the responses to each reason for attendance between students attending HBCUs and those attending TWIs, taking their responses to other reasons into account. It finds that the primary reason for choosing an HBCU is that a parent had attended the institution, followed by the financial aid offered, followed by lower tuition and cost of living. In addition, the opportunity for students to live far away from their parents is a factor, suggesting that the schools, located mostly in the South, draw students from other regions of the country. The fact that students perceive the costs to be lower at the HBCUs is not surprising; according to the NPSAS data, the average student attending an HBCU pays $1,945 in tuition annually, as opposed to $3,309 for the average student attending a TWI.

### Aspirations and Experiences of HBCU Students

To test claims regarding the benefits of HBCUs, seven educational experiences and aspirations in three areas are examined. Advocates of HBCUs have identified all of these as justifications for the schools. Levels of peer interaction and student-faculty interaction are included in the analysis because advocates of HBCUs have suggested that these schools have higher levels of such interaction than TWIs, at least for Black students. Occupational and educational aspirations of students are included because advocates have suggested that HBCUs raise these aspirations. Finally, the tendency of students to participate in community service and to aspire to leadership positions in their community are included because advocates have suggested that HBCUs do a better job than TWIs in preparing students for community leadership.

The findings confirm the view of advocates only in the area of student educational and occupational aspirations. Students attending HBCUs, and Black students in particular, are more likely to aspire to a graduate education after college and to obtain a job in one of the professions. On the other hand, students attending HBCUs do not experience higher levels of peer and faculty interaction than students at TWIs, and they are no more likely to aspire to leadership positions or to engage in community service.

The analysis of the NPSAS data suggests that the primary educational justification of HBCUs is somehow tied to preparing students for the professions. To some degree, this adheres to Booker T. Washington's notion that the primary focus of the schools is, or ought to be, vocational; they can prepare students to compete in the job market. Yet the types of occupations that Booker T. Washington emphasized differed significantly from the types Du Bois emphasized. Du Bois wanted HBCUs to prepare students for the helping professions because teachers and social workers could become supports for Black communities. Washington, on the other hand, wanted HBCUs to prepare students for professions

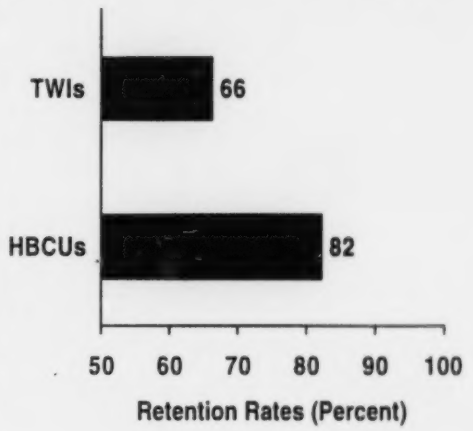
and occupations that would ensure their economic security; educators, however, see the sciences, engineering, and business as having greater earnings potential. Thus, while the lack of differences between TWIs and HBCUs in aspirations to leadership positions or community service may provide support for the Washington view, it may still be the case that the professions found to be important are the helping professions, which would support the Du Bois view. In order to answer that question, as well as to assess the actual decision of students to attend graduate school (as opposed to merely aspiring to do so), data on graduate students need to be analyzed. That is the purpose of the following sections.

## Analyses of the 1993 GRE Database and the AAU/AGS Project Database

Two databases provide information on the graduate school decisions of students attending HBCUs. The 1993 Graduate Record Examination (GRE) database includes all of the information supplied by students who took the GRE in 1993. The GRE is a test taken by most students applying to graduate school. Since students taking the GRE identify their undergraduate institution, it is possible to compare the responses of students attending HBCUs to those of students attending TWIs.

The database, which includes all students who took the GRE in a given year, is national in scope. The database also includes both Black and White students, making comparisons between ethnic groups possible. The database maintained by the AAU/AGS Project for Research on Doctoral Education follows longitudinally all graduate students in doctoral programs for 10 fields of study at approximately 40 major research universities from 1989 through 1994. Since the undergraduate institution is identified, the graduate school experiences of HBCU graduates and TWI graduates can be compared. This database is not nationally representative, however, and while it includes both Blacks and Whites, the number of Whites who have attended HBCUs is too small to allow meaningful comparisons.

Figure 1: Retention Rates at HBCUs and TWIs




From these databases, it is possible to answer three basic research questions:

- How do the retention rates of graduate students who have graduated from HBCUs compare to those of students who have graduated from TWIs?
- How do the demographic characteristics of graduate students who have graduated from HBCUs differ from those of students who have graduated from TWIs?
- How does the choice of graduate major or field differ between students who have graduated from HBCUs and students who have graduated from TWIs?

### Retention Rates of Graduate Students

The retention rates of students can be examined using the AAU/AGS database. Of the 14,000 students followed in the database, 284 are Black, and of these 34 (or 12 percent) attended HBCUs as undergraduates. Seven of these 34 (or 21 percent) received their Ph.D. by 1994, as opposed to 44 of the 250 (or 18 percent) who attended TWIs. The HBCU group also finished its graduate work somewhat more

quickly than the TWI group. HBCU students finished in an average of 5.57 years, while the TWI students finished in an average of 6.14 years.

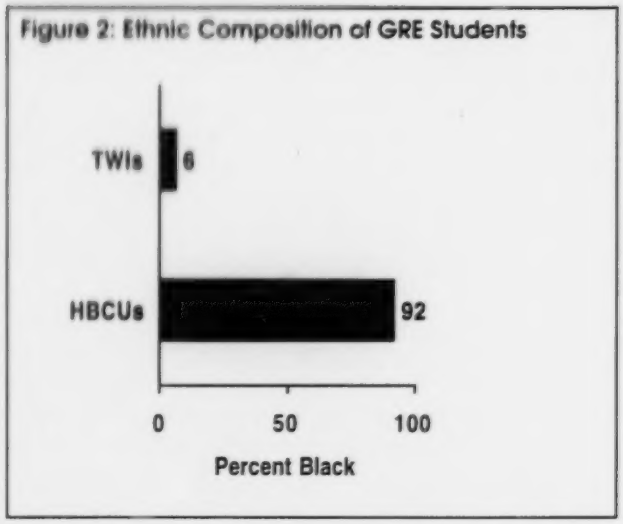
Defining retention as students who obtain a Ph.D. may be too narrow a definition, however. Particularly with a database that includes students who have only been in graduate school for a couple of years, students can be said to have been retained if they remain actively enrolled in the graduate program, or have obtained a terminal master's degree. By this broader measure of retention, HBCU students appear to evince higher retention rates than TWI students. As Figure 1 indicates, of the 250 TWI Black students, 66 percent either received a degree or remained active in the program by 1994, as opposed to 82 percent of the 34 HBCU Black students. While these results should be treated with caution because of the fairly small number of students observed, they do suggest that HBCU students are more persistent in graduate programs than similar students from TWIs.

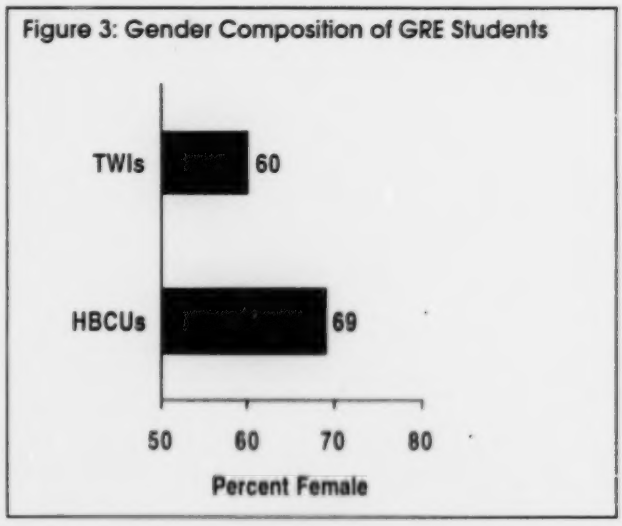
### Demographics of GRE Registrants

The GRE database provides information on all students who took the GRE in 1993. In total, 351,017 Blacks and Whites took the GRE that year (students from other ethnic groups are not included in the analysis, as they represent an insubstantial proportion of students attending HBCUs). Of these students, 30,203 were Black, indicating that one Black took the GRE for every 10 Whites. Of the Blacks, 33 percent had attended HBCUs. When it is recalled that 28 percent of all Blacks graduate from HBCUs (calculated from Snyder and Hoffman, 1995), this suggests that Black HBCU graduates are disproportionately likely to choose to take the GRE, confirming the finding from NPSAS that they are more likely than Blacks from TWIs to aspire to graduate education.

As Figure 2 indicates, the ethnic makeup of students taking the GRE differs markedly depending on whether they have attended HBCUs or TWIs. Ninety-two percent of the database's Blacks and Whites who have attended HBCUs are Black, as opposed to 6 percent of those who have attended TWIs. Given that Blacks make up about 80 percent of students attending HBCUs and 8 percent of students attending TWIs, this suggests that Whites from TWIs are more likely to pursue graduate education than Whites from HBCUs, while Blacks from HBCUs are more likely than Blacks from TWIs to pursue it.

There are other interesting demographic differences between HBCU and TWI students. First, HBCU students are disproportionately female. As Figure 3



indicates, 69 percent of the students from HBCUs are female as opposed to 60 percent from TWIs. HBCU students are also of lower SES. In terms of father's education (Figure 4), half of HBCU students' fathers had only a high school diploma or less, as opposed to less than 30 percent of TWI students' fathers. In contrast, 29 percent of HBCU students' fathers obtained at least a bachelor's degree, as opposed to 52 percent of TWI students' fathers. In terms of mother's education (Figure 5), slightly more than 40 percent of HBCU students' mothers had only a high school diploma or less, as opposed to slightly more than 30 percent of TWI students' mothers. In contrast, 32 percent of HBCU students' mothers obtained at least a bachelor's degree, as opposed to 40 percent of TWI students' mothers.

### Choice of Graduate Major

The most striking differences between HBCU and TWI students, however, lie in their choices of graduate major. These differences are made most meaningful by comparing HBCUs and TWIs for four distinct demographic groups: White males, White females, Black males, and Black females. The reason for examining these groups separately is that research has suggested that there are large differences in choice of major between these groups. Females, for instance, are generally less likely than males to enter the sciences and engineering. In assessing differences between HBCUs and TWIs, then, it is worthwhile seeing how large these differences are in comparison to differences between the demographic groups.

Figure 6 shows differences in the choice of graduate major for Black females attending TWIs, Black males attending TWIs, Black females attending HBCUs, and Black males attending HBCUs. The various majors are divided into the paraprofessions (primarily the helping professions of health, education, and social work); social sciences and humanities; business (accounting, banking, finance, business administration); academic science (biology, chemistry, physics); and engineering. Some of the differences seem to be primarily between males and females. Females are much more likely than males to choose health and education regardless of the institution attended. Other differences, however, seem to be more between students attending HBCUs and those attending TWIs, regardless of gender. Black HBCU students, regardless of gender, are more likely than Black TWI students to choose to major in academic science or business. For instance, 22 percent of Black male HBCU

**Figure 4: Father's Education**

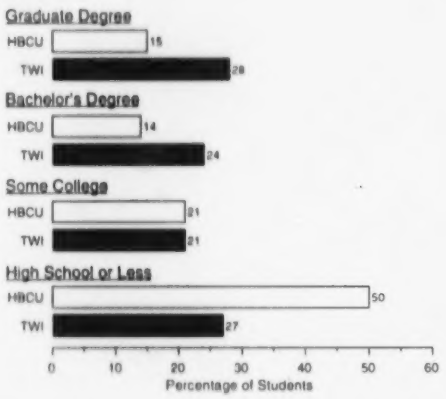



**Figure 5: Mother's Education**

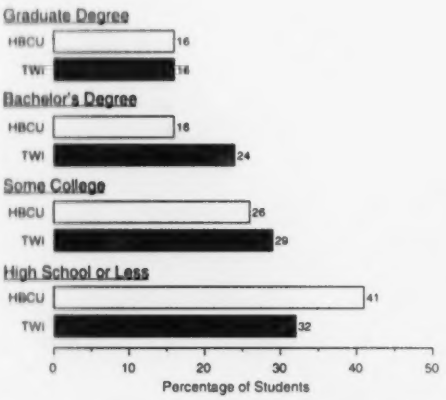


**Figure 6: Choice of Graduate Major — Black Students**

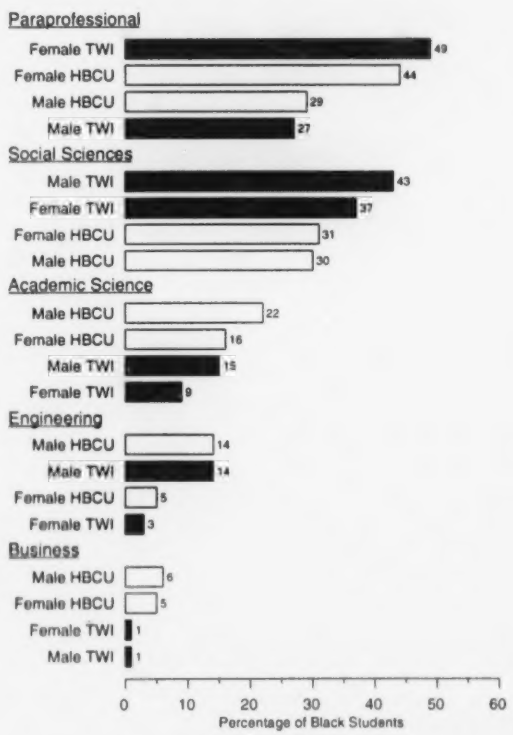



**Figure 7 : Choice of Graduate Major — White Students**

students and 16 percent of Black female HBCU students choose to major in academic science, as opposed to 15 percent of Black male TWI students and 9 percent of Black female TWI students. On the other hand, Black HBCU students, regardless of gender, are less likely to major in the social sciences. Forty-three percent of Black TWI male students and 37 percent of Black TWI female students choose to major in the social sciences, as opposed to 31 percent of Black HBCU female students and 30 percent of Black HBCU male students. For the paraprofessions and engineering, gender differences seem to be more important, with females more likely to choose a major in the paraprofessions and males more likely to choose to major in engineering.

For Whites (Figure 7), it appears that the differences for all majors form a pattern that is also consistent across majors based on both gender and the type of institution attended, although gender appears to be more important than for Blacks. White HBCU students are more likely to choose a paraprofession and less likely to choose academic science than White TWI students. Similarly, White females are more likely than White males to choose a paraprofession and less likely than White males to choose an academic science. The gender difference appears to be markedly more important than the HBCU difference for Whites, in that Whites can be ranked by the percentage choosing the paraprofessions and not choosing academic science, for instance, in this order: HBCU White females, TWI White females, HBCU White males, and TWI White males. The two ethnic groups, then, are affected quite differently

by their experiences at HBCUs. First, Blacks attending HBCUs will be steered toward science, engineering, and business, while Whites attending HBCUs will be steered toward the paraprofessions and away from science. (Alternatively, it may be that White students interested in science will be less likely to choose an HBCU than White students interested in education, health, or social work.) Second, gender appears to be a stronger influence on choice of major for Whites than for Blacks.

To more accurately measure the impact of attending an HBCU on choice of graduate major, the odds of choosing a given major for an HBCU student as opposed to a TWI student are measured, taking into account the effects of various other student characteristics, such as gender and ethnicity, on these odds. (For study methodology, see Appendix.) "Odds" refer to the ratio between the chance that one group (in this case students attending HBCUs) will make a certain choice and the chance that another group (in this case students attending TWIs) will make that same choice. For example, three to one odds indicate that HBCU students are three times more likely than TWI students to choose the given major.

The odds, presented in Table 1, indicate that HBCU students are more likely than TWI students to choose academic science, engineering, or business as majors. In the academic science column, it can be seen that the odds of an HBCU student choosing that major are 2.4 to one, meaning that such a student is more than twice as likely as a TWI student to do so. This is quite a large number, when it is compared to the size of the effects of some other characteristics. The quantitative abilities of students, which one would assume are strongly associated with their decision to choose science, are measured by the student GRE score on the quantitative part of that examination. The odds of a student with a high score choosing science are two to one, somewhat less than those for HBCU attendance. There is a similar effect of HBCU attendance on the choice of engineering as a major, with

**Table 1: Odds of Choosing Graduate Major**

| Student Characteristics | Academic Science | Health/ Agriculture | Engineering | Social Science | Humanities | Education | Business | Social Work |
|---|---|---|---|---|---|---|---|---|
| Attends HBCU | 2.3570 | .4690 | 2.3817 | .6912 | — | — | 3.0896 | — |
| English Best Language | 1.4257 | .7822 | — | — | — | .6776 | — | — |
| Ethnicity is Black | — | .6941 | 1.8281 | 1.8281 | — | .5948 | — | .6021 |
| Father's Education | — | .9601 | — | — | 1.0688 | .9183 | — | — |
| Gender is Female | .7344 | 2.2365 | .3198 | .3198 | .5979 | 1.8842 | .5556 | 3.4514 |
| GRE-Analytic | — | — | .9979 | .9979 | 1.0020 | .9989 | 1.0050 | — |
| GRE-Quantitative | 2.0076 | — | 1.0159 | 1.0159 | .9930 | .9984 | .9981 | .9969 |
| GRE-Verbal | .9979 | .9968 | .9948 | .9948 | 1.0073 | .9985 | .9953 | — |
| Mother's Education | — | — | .9364 | .9364 | — | — | — | .9479 |
| Undergraduate GPA | .9333 | 1.0684 | .8814 | .8814 | 1.2925 | .8928 | .7661 | .8391 |
| Is U.S. Citizen | — | 1.500 | — | — | — | 1.8563 | 2.7471 | 22.2100 |

All results statistically significant at .05 level.



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odds at 2.4 to one. The choice of business is the most strongly associated with attending an HBCU, with odds of three to one.

It is worth noting that it is important to take into account other student characteristics because, as shown by the figures, these also influence the choice of major. Gender is a particularly important factor in that females have high odds for choosing health, education, or social work, and low odds for choosing academic science, engineering, or business. (The odds for engineering are .3, for instance, indicating that females are only a third as likely as males to choose it as a graduate major.) In terms of ethnicity, Blacks are more likely than Whites to choose engineering or the social sciences, and less likely to choose health, education, or social work. Finally, student academic abilities exert an influence on choice of major. Students with strong quantitative skills are more likely to choose academic science or engineering, whereas those with strong verbal skills are more likely to choose the social sciences or humanities. Strong analytic skills seem to be associated with choosing social science, humanities, or business.

These analyses provide some answers to the research questions discussed above. First, it appears that retention rates for Black HBCU students attending graduate school are somewhat higher than those for Black TWI students. Black HBCU students are more likely than Black TWI students to obtain a Ph.D. and less likely to leave the program without obtaining a degree. The demographic characteristics of GRE students show that those who have attended HBCUs are disproportionately Black, while those who have attended TWIs are disproportionately White, suggesting that each type of school better serves the ethnic group that it has traditionally served. The fact that the HBCU students are of lower SES than the TWI students also suggests that the HBCUs provide an avenue for students from humble origins to pursue a graduate education.

The analysis of choice of major suggests that in practice the Booker T. Washington view of the HBCUs is more prevalent than the W.E.B. Du Bois view. Students attending HBCUs are no more or less likely than students attending TWIs to enter those professions, such as teaching or social work, that would support community leadership, and are in fact less likely to enter the health professions (excluding medical school, which is not analyzed here). On the other hand, HBCU students are more likely to choose those professions conducive to economic success in the marketplace (business) or professions requiring advanced, but primarily technical, skills (science and engineering).

## HBCUs and the Professions: Implications for Policy

These analyses suggest that some of the educational justifications of HBCUs proposed by their advocates are not supported by the data. The notion that HBCUs have higher levels of social interaction and interaction with faculty is not supported by the NPSAS analysis; educators will therefore have to look elsewhere to explain academic successes at HBCUs. The notion that students attending HBCUs are more likely to become community leaders is also not supported. The NPSAS analysis indicates that HBCU students are no more likely than TWI students to aspire to leadership positions or to participate in community service. The GRE analysis indicates that students attending HBCUs are no more likely than students attending TWIs to pursue graduate education in the helping professions, such as education and social work.

The justification that does emerge is that HBCUs prepare Black students to compete successfully in the job market with Whites. First, the NPSAS analysis finds that one of the attractions of HBCUs is that they are more affordable than TWIs; the affordability of HBCUs therefore may encourage students who might otherwise either attend a community college or no college at all to attend a four-year institution. Second, the GRE analysis finds that students from HBCUs taking the GREs are from less affluent backgrounds than students from TWIs; this suggests that HBCUs enable students who might not otherwise do so to continue their education at the graduate level. Third, HBCU students are more likely than TWI students to pursue graduate education and to aspire to a professional career, as the NPSAS analysis suggests. Fourth, the AAU/AGS analysis suggests that, once they enroll, HBCU students are more likely than TWI students to remain in graduate school, also suggesting that they may be somewhat better prepared to remain there. Finally, the GRE analysis finds that students from HBCUs are disproportionately likely to choose the sciences, engineering, or business as graduate majors, suggesting that HBCUs encourage students to enter fields that are attractive by virtue of their lucrativeness much more than their tendency to promote community political action. HBCUs, then, seem to be steering Black students into the professions where minorities are most underrepresented. This is an advantage not only for Black students who would have attended TWIs in the absence of HBCUs, but for the many Blacks who, because of the higher cost of TWIs, would not have attended any college in the absence of HBCUs.

Important research questions remain to be answered, however. It is still not known why students attending HBCUs perform in the ways discussed in this study. Answering this question is outside the scope of existing large-scale databases because it requires information on the pedagogies, missions, and social environments of HBCUs. It would therefore require a significant data collection effort. A second question is whether or not the effects of HBCUs differ among types of schools. HBCUs include a wide range of institutions — public and private, four-year and two-year, agricultural land-grant

institutions and elite universities. The findings presented here represent only the average for all HBCUs, and therefore may mask the effects that are unique to particular types of institutions. Again, data that distinguish between types of HBCUs are not readily available and would have to be collected. Finally, TWIs include a wide range of institutions, and different types of TWIs should be compared to different types of HBCUs. For instance, in studying public four-year HBCUs, it would be worthwhile to compare them to public four-year TWIs. Data to make these comparisons are also not readily available and would have to be collected.

Further research on HBCUs, however, is contingent on their continued existence. If they are eliminated, the key to their positive effects on Black students will not be discovered. This research does suggest that HBCUs possess an educational justification in that there is something they accomplish for Blacks better than TWIs — they better prepare Blacks for those professions in which they are most underrepresented. This benefit applies both to Blacks who would have attended a TWI and to Blacks who might not have attended any postsecondary institution. Whether or not this justification is sufficient to ensure their continued existence is a question for the courts and legislatures to answer.

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# Appendix: Study Methodology

**NPSAS Study**: For full details of this study, see Wenglinsky (1996).

**AAU/AGS Study**: AAU/AGS was used for comparisons of retention rates between students attending HBCUs and TWIs, and for estimates of the length of time to degree attainment for students at the two types of institutions. For all of these figures, the longitudinal version of the database, with data from 1989 through 1994, was used. Of the 14,477 students for which data were collected, the 284 identified as Black were selected for analysis. These students were then divided into HBCU and TWI students by comparing their institutional identification numbers in the database with a list of identification numbers for the HBCUs. The match produced 34 Black HBCU students. To measure retention rates, the measure from the database of student educational outcomes in 1994 was used. These outcomes were: graduates with Ph.D., terminal master's, still enrolled, inactive, withdrew, and unresolved. To determine the percentage of HBCU and TWI students who completed their Ph.D.'s, the number at each type of institution who graduated with a Ph.D. was divided by the number of cases for that type of institution. To determine the percentage of HBCU and TWI students who graduated with a Ph.D., graduated with a terminal master's, or were still enrolled (Figure 1), first the cases of students who had enrolled in 1992 and 1993 were excluded as too recently enrolled to indicate the ability of a student to persist or not. The numbers of the remaining 185 cases in each of the three above categories were counted and divided by the numbers in HBCUs and TWIs. To calculate length of time to graduation, the year of enrollment was subtracted from the year of graduation and averaged for all students who received a Ph.D.

**GRE Study**: From the full database of students who took the GRE in 1993, Blacks and Whites were selected for analysis, totaling 351,017 cases. To produce Figures 2 through 7, HBCU students were identified by matching their GRE baccalaureate institutional identification numbers to the names of schools in the GRE application packet. These names were then matched to a list of the 103 HBCUs to determine whether or not the school the student attended was an HBCU. All cases of students attending an HBCU were retained for the subsequent analysis (10,669 cases). Of the remaining 340,348 cases, a random sample of 10,669 cases was selected and matched with the HBCU cases to produce a sample evenly stratified between the two types of institutions. For the comparisons in Figures 2 through 7, the percentages in each stratum were compared; thus the results were nationally representative even without weighting. For Figures 2 and 3, the GRE variables, as supplied in the database, were used for the calculations. For Figures 4 and 5, more specific categories of mother's and father's education were collapsed into one of the appropriate four categories. For Figures 6 and 7, the codes for the graduate majors were collapsed into the 50 larger categories in the application packet. These were then further collapsed into academic science (biology, chemistry, computer science, earth science, mathematics, physics), engineering

(all types), business (accounting, banking and finance, business administration), social sciences/humanities (anthropology, economics, political science, psychology, sociology, art history, art performance, English, foreign languages, history, and philosophy), and various para- or semiprofessions, (i.e., nonacademically oriented graduate programs that do not fit into the business or engineering categories, such as health sciences, education, social work, and agricultural sciences). For Table 1, eight logistic regression models were developed. For the results to be nationally representative, the sampled cases (those of TWI students) had to be multiplied by the inverse of their probability of selection, while the HBCU cases were multiplied by 1 (which is the inverse of their probability of selection). To maintain the appropriate degrees of freedom, all weights were divided by the mean of the weights. Regression was performed to control for various student characteristics simultaneously. Logarithmic models were developed because the independent variables were dichotomous and highly skewed. Dependent variables were each defined as whether or not the student selected one of a particular category of majors. The majors were the same as in Figures 6 and 7, except that the social sciences and humanities were given separate categories, and two of the paraprofessions, education and social work, were also given separate categories. In addition to whether or not the student attended an HBCU, the determination of which was described above, the independent variables were taken from the GRE application packet responses (English is the student's best language, student ethnicity, student gender, mother and father education, undergraduate GPA, and citizenship status) or from the results of the GREs as retained in records by ETS® (for the Analytic, Verbal, and Quantitative scores). From the resulting logistic models, the odds ratio was calculated as the constant $e$ being raised to the power of the log odds ratio parameter for each variable in each model. Full printouts of the analysis results are available on request.

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